

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
December 07, 2014

Prepared by
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Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for December 07, 2014 07:00 to December 08, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine (Cl_2), hydrogen sulfide (H_2S), hydrochloric acid (HCl), percent of the Lower Explosive Limit (LEL), oxygen (O_2), peroxides, particulate matter (10 micron particles, PM_{10}), sulfur dioxide (SO_2), sulfuric acid (H_2SO_4), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems® AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area and an additional three units throughout the day by frac tanks near the designated decon areas. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S , and SO_2 . AreaRAE Unit 06 recorded one instantaneous detection of 5.4 ppm for VOCs at approximately 22:13, but the concentration was not sustained. Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Particulate monitors were data-logged along the facility perimeter collocated with AreaRAE stations 1, 2, 3, and 4. Table 3 summarizes data-logged PM_{10} data from these units.

Table 1: Manually-Logged Real-Time Air Monitoring Summary¹
December 07, 2014 07:00 – December 08, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Concentration Range
Community	Cl ₂	Gastec 8La	6	0	NA	<0.05 ppm
	H ₂ S	MR+ / MR Pro	27	0	NA	<1 ppm
	HCl	Gastec 14L	6	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	27	0	NA	<1 %
	O ₂	MR+ / MR Pro	27	27	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	6	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	26	26	0.013	0.004 - 0.027 mg/m ³
	SO ₂	MR+ / MR Pro	27	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	6	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	28	0	NA	<0.1 ppm
Exclusion Zone	Cl ₂	Gastec 8La	4	1	0.1	0.1 - 0.1 ppm
	H ₂ S	MR+ / MR Pro	2	0	NA	<1 ppm
	HCl	Gastec 14L	1	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	5	0	NA	<1 %
	O ₂	MR+ / MR Pro	3	3	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	1	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	1	1	0.005	0.005 - 0.005 mg/m ³
	SO ₂	MR+ / MR Pro	5	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	1	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	5	0	NA	<0.1 ppm
Work Area	Cl ₂	MR+ / MR Pro	39	1	0.5	0.5 - 0.5 ppm
	H ₂ S	MR+ / MR Pro	44	0	NA	<1 ppm
	HCl	Gastec 14L	1	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	44	0	NA	<1 %
	O ₂	MR+ / MR Pro	44	44	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	15	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	29	29	0.014	0.009 - 0.023 mg/m ³
	SO ₂	MR+ / MR Pro	29	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	12	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	46	3	1.9	0.2 - 4.9 ppm

¹Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

²Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 2: AreaRAE Air Monitoring Summary¹
December 07, 2014, 2014 07:00 – December 08, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range
Unit 01	H ₂ S	4557	265	0.2 ppm	0.1 - 0.4 ppm
	LEL	4557	0	NA	< 1 %
	SO ₂	4557	0	NA	< 0.1 ppm
	VOC	4557	83	0.1 ppm	0.1 - 0.2 ppm
Unit 02	H ₂ S	4631	238	0.1 ppm	0.1 - 0.3 ppm
	LEL	4631	0	NA	< 1 %
	SO ₂	4631	0	NA	< 0.1 ppm
	VOC	4631	14	0.1 ppm	0.1 - 0.5 ppm
Unit 03	H ₂ S	4647	379	0.1 ppm	0.1 - 0.2 ppm
	LEL	4647	0	NA	< 1 %
	SO ₂	4647	0	NA	< 0.1 ppm
	VOC	4647	62	0.2 ppm	0.1 - 3.4 ppm
Unit 04	H ₂ S	4637	486	0.1 ppm	0.1 - 0.2 ppm
	LEL	4637	0	NA	< 1 %
	SO ₂	4637	0	NA	< 0.1 ppm
	VOC	4637	0	NA	< 0.1 ppm
Unit 05	H ₂ S	1326	1039	0.1 ppm	0.1 - 0.4 ppm
	LEL	1326	0	NA	< 1 %
	SO ₂	1326	0	NA	< 0.1 ppm
	VOC	1326	20	0.4 ppm	0.1 - 1.4 ppm
Unit 06	H ₂ S	1386	1036	0.3 ppm	0.1 - 0.6 ppm
	LEL	1386	0	NA	< 1 %
	SO ₂	1386	0	NA	< 0.1 ppm
	VOC	1386	536	0.2 ppm	0.1 - 5.4 ppm
Unit 08	H ₂ S	1173	308	0.1 ppm	0.1 - 0.2 ppm
	LEL	1173	0	NA	< 1 %
	SO ₂	1173	0	NA	< 0.1 ppm
	VOC	1173	2	0.4 ppm	0.1 - 0.7 ppm

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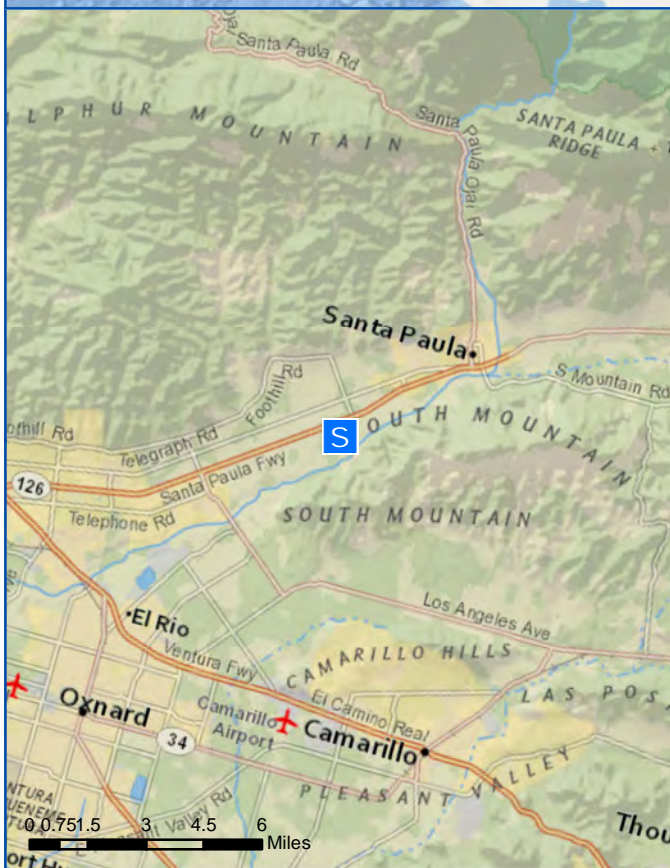
Table 3: AM510 PM₁₀ Monitoring Summary¹
 December 07, 2014, 2014 07:00 – December 08, 2014 07:00

Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10601072	AR01	3664	3664	0.011	0.004 - 0.075 mg/m ³
10704074	AR02	4742	4742	0.011	0.004 - 0.143 mg/m ³
10408087	AR03	4882	441	0.015	0.001 - 0.301 mg/m ³
10704072	AR04	5112	5112	0.008	0.001 - 0.134 mg/m ³

Appendix A

Incident Maps:

Real-time Air Monitoring Locations and Incident Site



Legend

 Site Location

0 250 500 1,000
Feet



Legend

- FRT Location
- Site Location

0 50 100 Feet



0 250 500 1,000
Feet



Legend

- FRT Location
- Site Location







Legend

Monitoring Location

- Non-detect (< 0.1 ppm)
- S Incident Site



Legend

Monitoring Location

- Detect (0.004 - 0.027 mg/m³)
- S Incident Site





Legend

Monitoring Location

- Detect (20.9 %)
- S Incident Site

0 0.125 0.25 0.5 Miles



Legend

Monitoring Location

- Non-detect (< 1 %)
- S Incident Site

0 0.125 0.25 0.5 Miles



Legend

Monitoring Location

- Non-detect (< 0.1 ppm)
- S Incident Site



Legend

Monitoring Location

- Non-detect (< 1 ppm)
- Incident Site

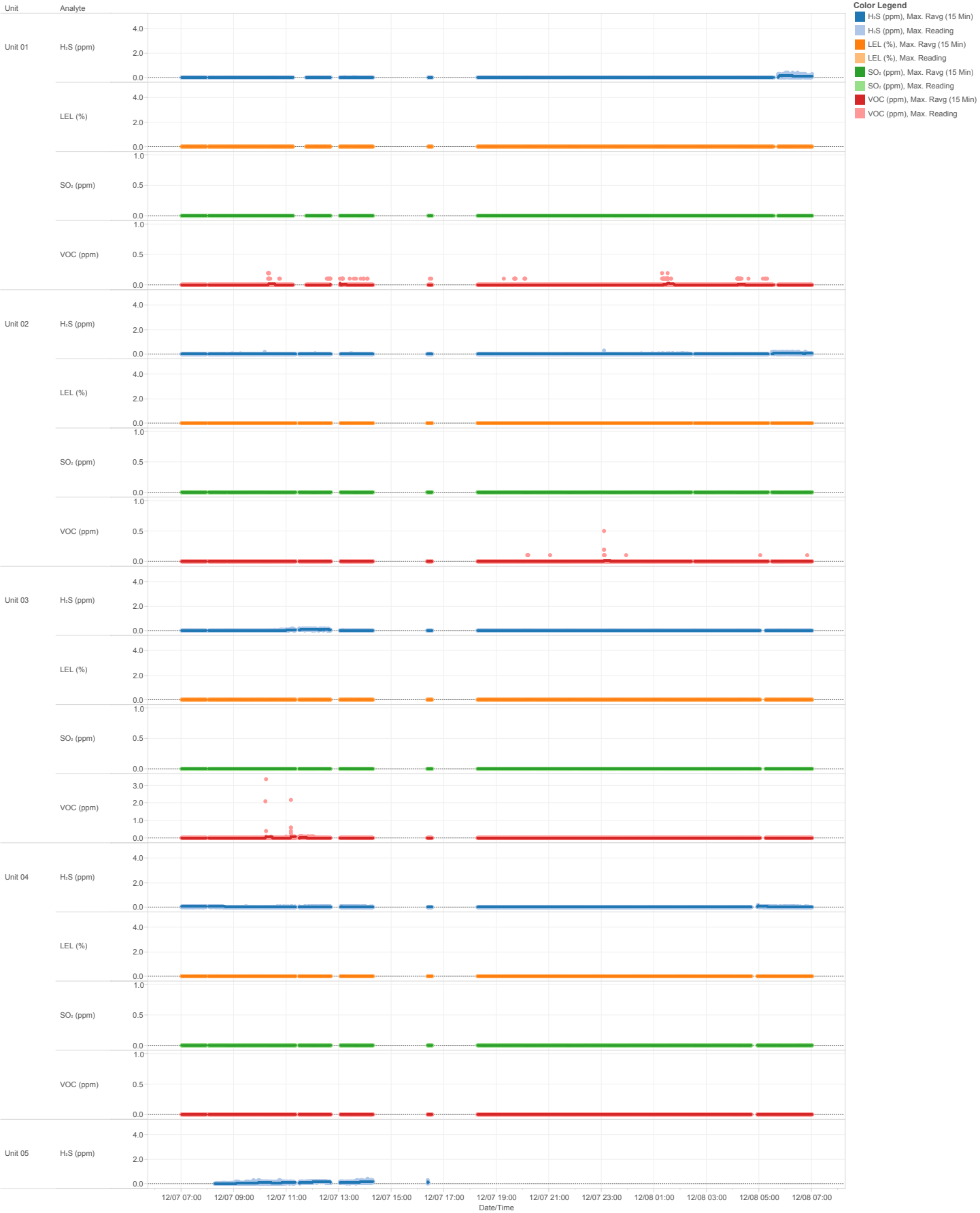


Appendix B:

AreaRAE Trend Graphs, AM510
Trend Graphs, and
AreaRAE/AM510 Air Monitoring
Location Map

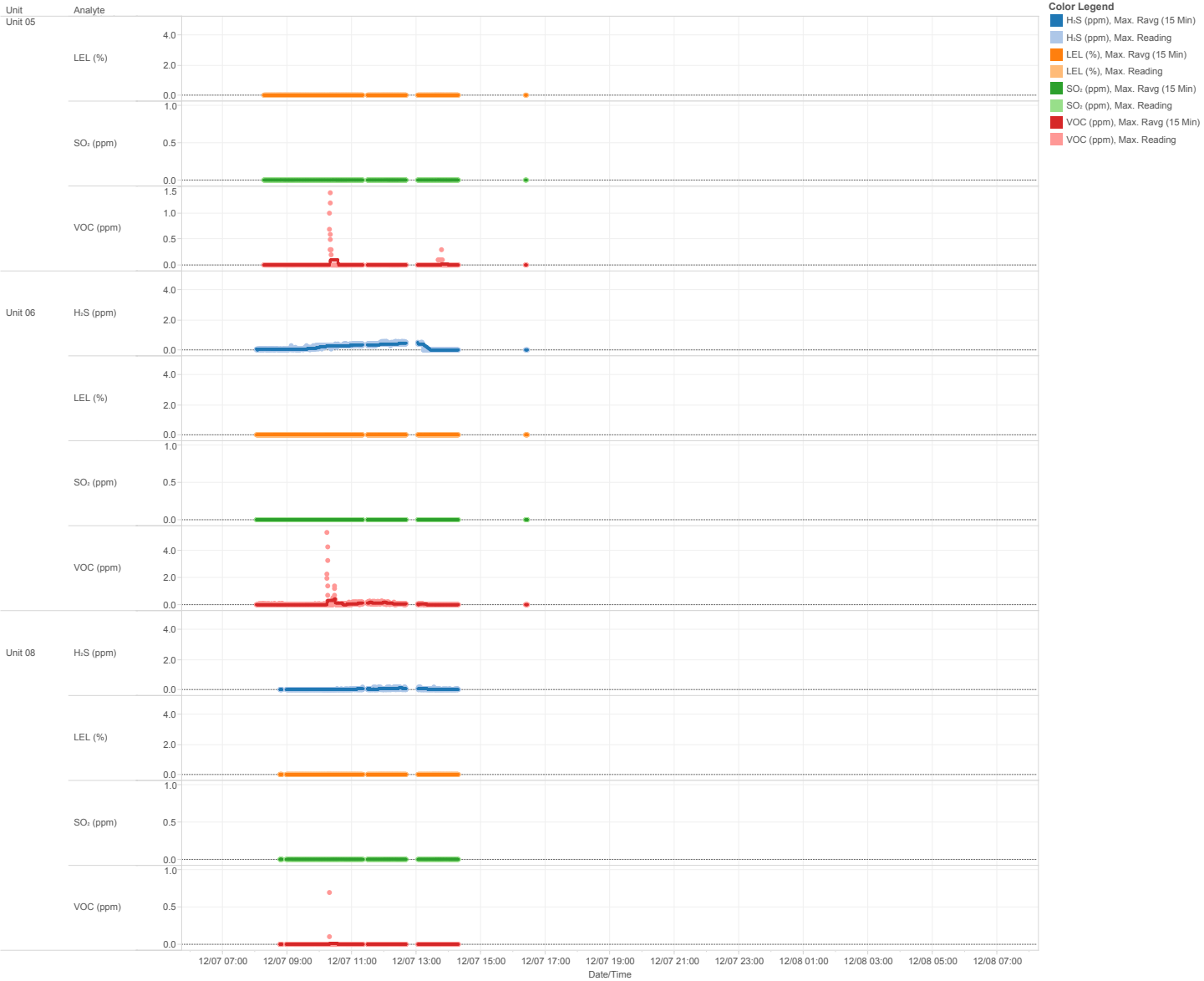


Patriot Environmental
AreaRAE Trend Graphs
12/07/2014 07:00 - 12/08/2014 07:00



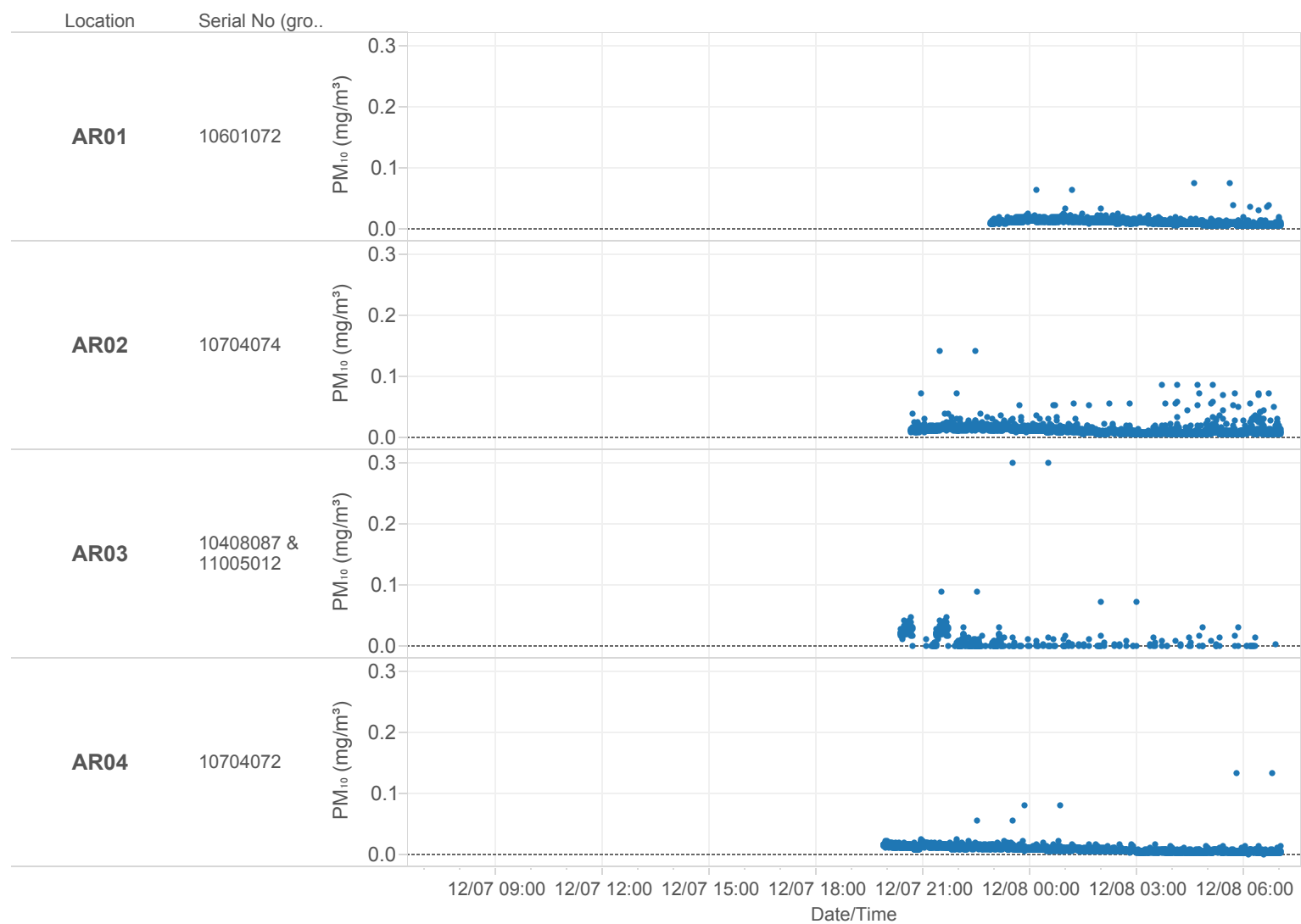
- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
AreaRAE Trend Graphs
12/07/2014 07:00 - 12/08/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM₁₀) Summary
12/07/2014 07:00 - 12/08/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format